# Economic value for trees in residential settings: Athens, Georgia

**J.M Bowker, H.Ken Cordell & Dudley Hartel**
**USDA Forest Service**
**Southern Research Station & SCUFRI**

**Tymur Sydor & David Newman**
**University of Georgia**
**Warnell School of Forest Resources**

**2003 National Urban Forest Conference**
**San Antonio, Texas, September 17-20, 2003**

# Objective

- **Estimate the economic value of trees in residential settings**
  - **Focuses on value of private benefits, e.g., aesthetics, shade, privacy, wildlife, etc.**
  - **Omits external and public goods considerations, e.g.,pollution, neighborhood aesthetics, etc.**

# Setting

- Athens-Clarke County
  - University town (100,000+ pop)
  - Area market center
  - Northeast GA – Piedmont
  - 77,617 acres overall
  - 51,423 acres ‘forested’
  - 47% estimated canopy

# Box Elder – 35 ft crown diameter

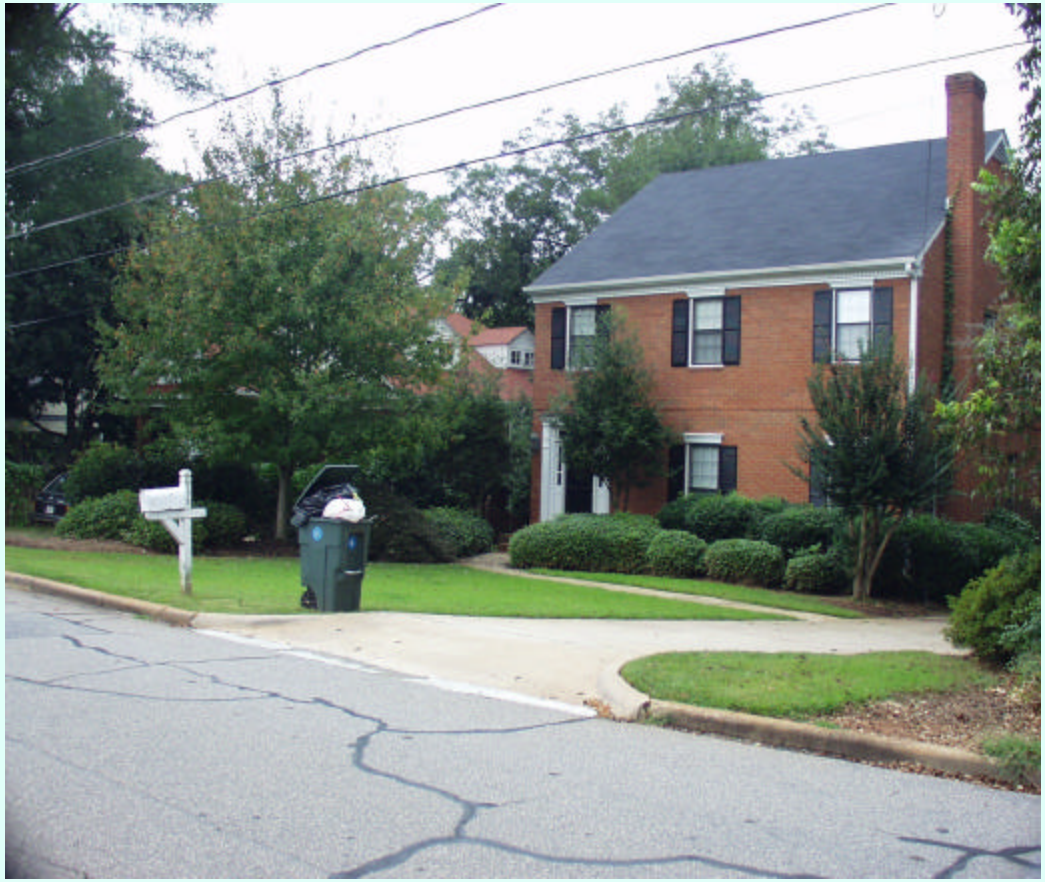
# Dogwood – 20 ft crown diameter

# Bradford Pear – 24 ft crown diameter

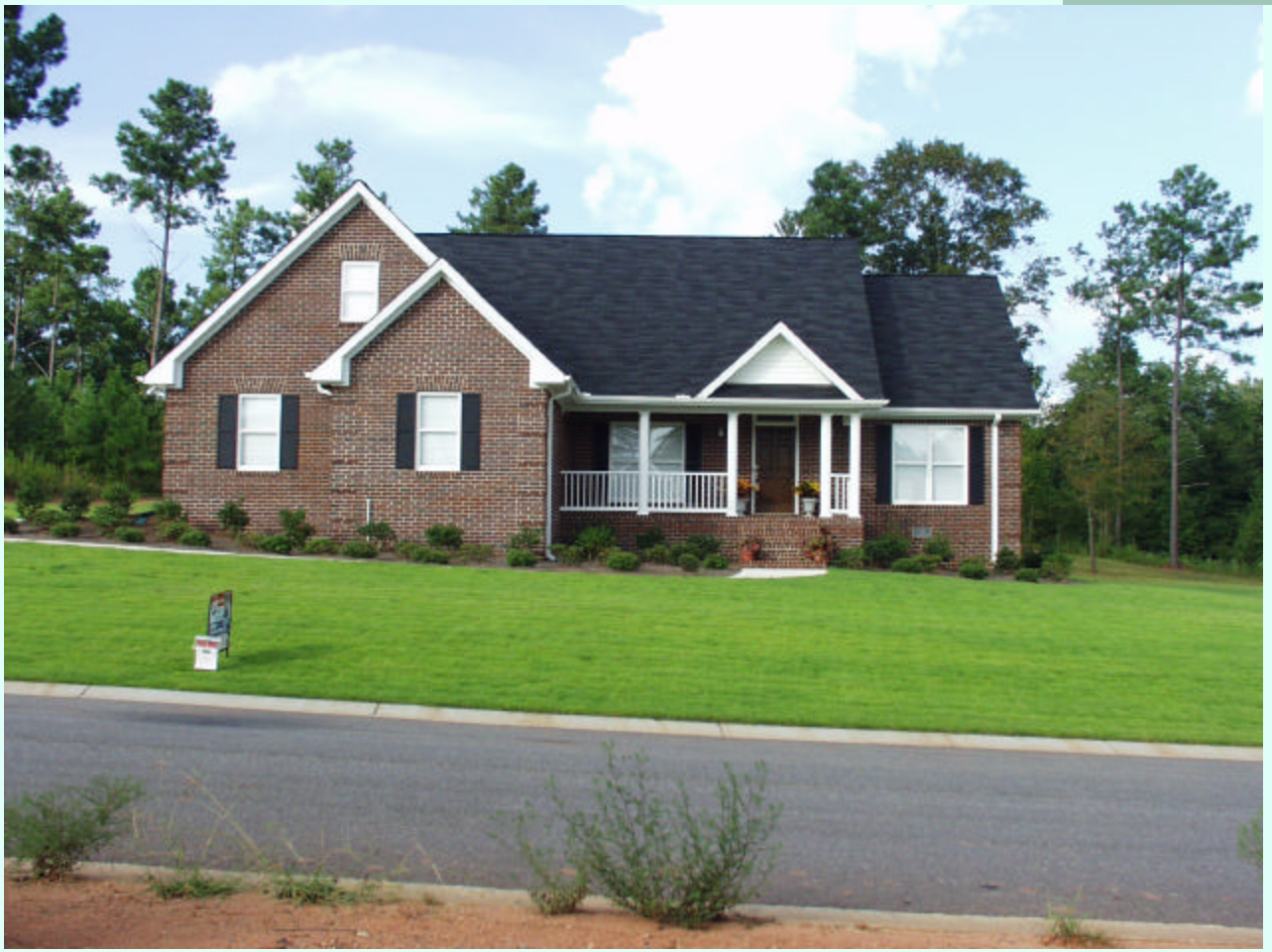
# Sugar Maple – 51 ft crown diameter

# White Oak – 33 ft crown diameter

# Red Maple – 18 ft crown diameter
# Trashcanicus Athenium – 2 ft



# Less than 10% canopy



# Empirical Model

- **Hedonic regression method**
  - **Price= *f* (house & landscape attributes) + error**
  - **Estimated with OLS regression**

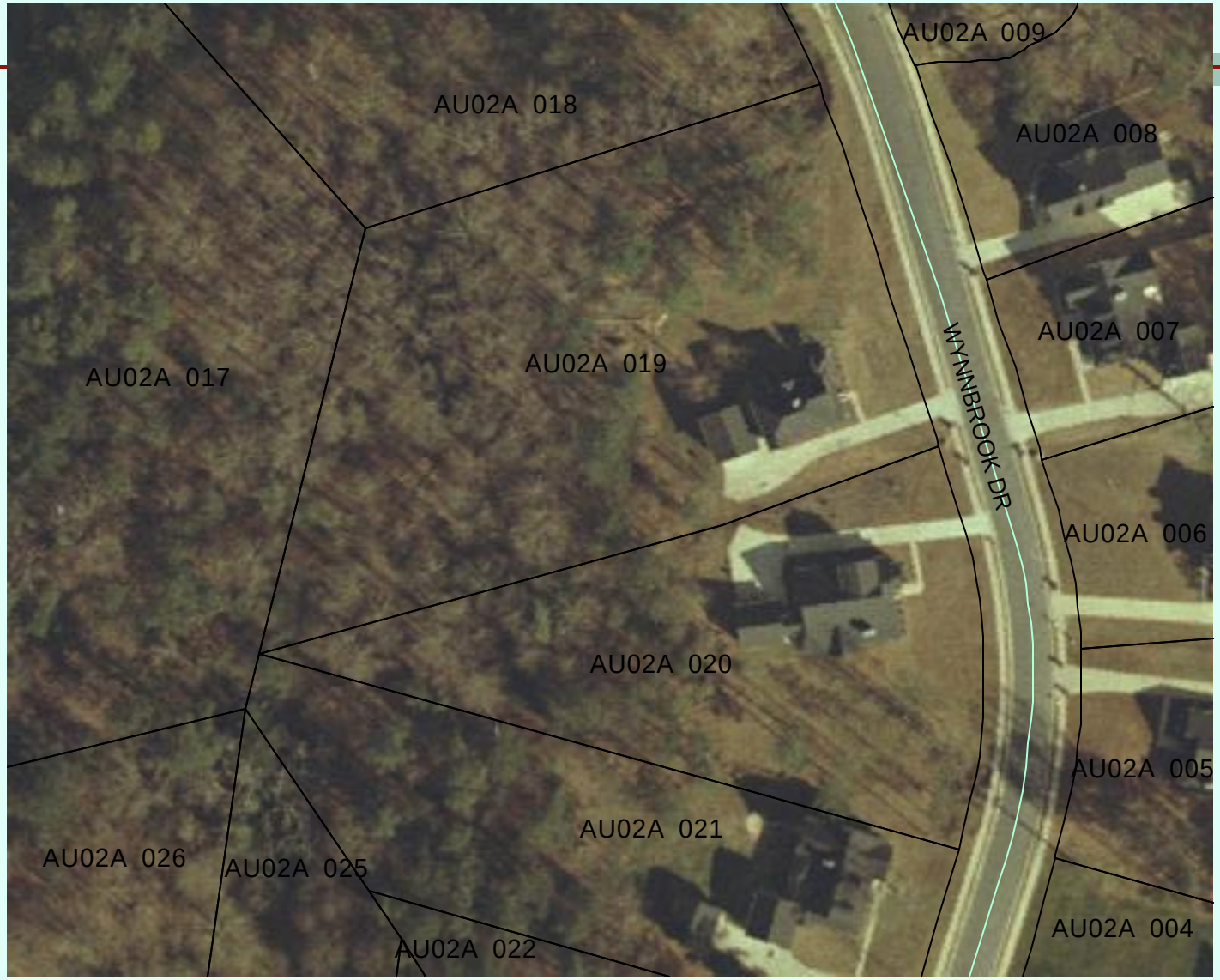
# Data (Athens single family sales 1998-2000)

| House attributes | Mean |
| --- | --- |
| Price | $122,267 |
| Heated area | 1,727 sq ft |
| Brick siding | 30% |
| Age | 46 yrs |
| Rooms | 6.01 |
| Porch area | 219 sq ft |

# Data con'd

| Landscape Attributes | Mean |
| --- | --- |
| Canopy | 58% |
| Distribution (back) | 33% |
| Composition (deciduous) | 67% |
| Tree lined street | 38% |
| Neighborhood effect | $91k/acre |
| Acreage (<3) | 0.65 acre |

# Aerial view of a subdivision with lot lines



# Regression Results (n=272, $r^2$=.72)

| Variable | Coefficient | t-Statistic |
|---|---|---|
| Intercept | -51010.98 | -4.16 |
| Neighborhood | 197.78 | 5.69 |
| Leaf cover | 296.68 | 3.18 |
| Heated area | 53.64 | 7.65 |
| Acreage | 13165.14 | 2.79 |
| Porch area | 41.87 | 2.55 |
| Year 1999 | 25567.87 | 3.44 |
| Year 2000 | 30679.39 | 4.60 |
| Brick siding | 10452.35 | 2.21 |

# A tale of two properties

| | House A | House B |
|---|---|---|
| Neighborhood | Average | Average |
| Leaf cover | 25 percent | 65 percent |
| Heated area | 2500 sq ft | 2500 sq ft |
| Acreage | 0.65 acre | 0.65 acre |
| Porch area | 300 sq ft | 300 sq ft |
| Brick | Yes | Yes |
| Year | 2000 | 2000 |
| | | |
| Exp [Price] | $ 179,000 | $ 191,000 |

# Losing the leaf cover for the trees (58% coverage, 0.65 acre lot)

| Age | Stem | Crown | Canopy | %Cover | $Value |
|---|---|---|---|---|---|
| 0+ | 2” | 6’ | 28 sf | 0.1 | $ 29 |
| 10 | 7-10” | 16’ | 201 | 0.7 | 211 |
| 20 | 12-17” | 26’ | 531 | 1.9 | 556 |
| 30 | 17-24” | 36’ | 1017 | 3.6 | 1066 |

# Conclusions

- Trees add to Athens property values
- 1% increase leaf cover → $296
- 10% increase leaf cover increases the value of “ave” house by 2.5%
- “Ave” tree (918 sf) → $963